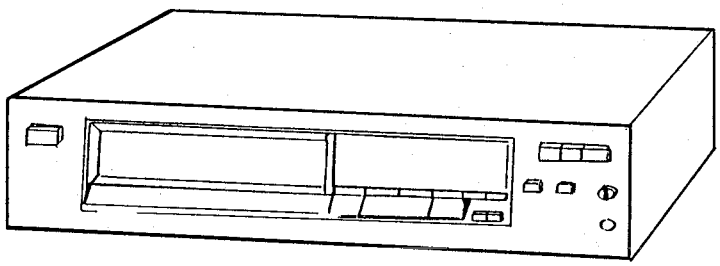
CDP-670

SERVICE MANUAL

US Model
Canadian Model
AEP Model



SPECIFICATIONS

Frequency response	2Hz—20kHz (±0.5dB)
Signal-to-noise ratio	More than 100dB
Dynamic range	More than 93dB
Harmonic distortion (1kHz)	Less than 0.008%
Channel separation	More than 95dB (1kHz)
Outputs	LINE OUT (phono jacks) Output level 2V (at 50kilohms) Load impedance over 10kilohms DIGITAL OUT (OPTICAL) (optical output connector) Wave length 660nm Output level -18dBm

General

Power requirements	AEP Model: 220V AC, 50/60Hz US, Canadian Model: 120V AC, 60Hz
Power consumption	AEP Model: 10W US, Canadian Model: 12W
Dimensions (approx. including projections)	AEP Model: 430x100x275mm (17x4x10 inches) US, Canadian Model: 430x95x275mm (17x3¾x10inches)
Weight (approx.)	3.5kg (7 ibs 12oz)

Supplied accessories

Audio signal connecting cord (2 phono plugs—2 phono plugs) (1)
Remote commander (1), Sony SUM-3 (NS) batteries (2)
AC power cord (1)

Desigh and specifications subject to change without notice.

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MICROFILM

COMPACT DISC PLAYER

SONY®

FEATURES

- Three CUSTOM EDIT functions, convenient for tape editing
  - — PROGRAM EDIT function for confirming the total playing time while choosing the selection to be programmed.
  - — TIME EDIT function for programming selections automatically to fit in a desired duration.
  - — TIME FADE function for stopping the play, fading out at the desired time.
- FADE-IN/FADE-OUT function for fading in or out the play when starting or stopping.
- SHUFFLE play for playing the selections in a random order.
- REPEAT function for a single selection, the whole disc, PROGRAM play, or SHUFFLE play.
- Easy-to-read display window shows the selection number being played, all the numbers of the selections on the disc (up to 16), the elapsed playing time, and the remaining time.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety check before releasing the set to the customer:
Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

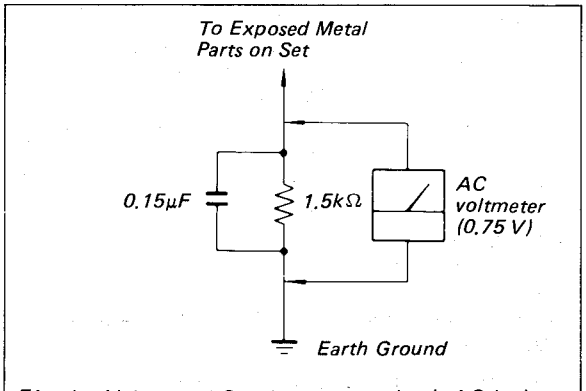


Fig. A. Using an AC voltmeter to check AC leakage.

SERVICING NOTE

PROTECTION OF EYES FROM LASER BEAM DURING SERVICING

This set employs a laser. Therefore, be sure to follow carefully the instructions below when servicing.

CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

NOTES ON HANDLING THE OPTICAL PICK-UP BLOCK OR BASE UNIT

The laser diode in the optical pick-up block may suffer electrostatic breakdown because of the potential difference generated by the charged electrostatic load, etc. on clothing and the human body.
During repair, pay attention to electrostatic breakdown and also use the procedure in the printed matter which is included in the repair parts.
The flexible board is easily damaged and should be handled with care.

1. Laser Diode Properties
   - Material: GaAlAs
   - Wavelength: 780 nm
   - Emission Duration: continuous
   - Laser Output: max. 44.6 μW*

     * This output is the value measured at a distance of about 200 mm from the objective lens surface on the Optical Pick-up Block.

2. During service, do not take the Optical Pick-up Block apart, and do not adjust the APC circuit. If there is a breakdown in the APC circuit (including laser diode), replace the entire Optiocal Pick-up Block (including APC borad).

BESKYTTELSE AF ØJNE MOD LASERSTRÅLING UNDER SERVICE

I dette apparat anvendes laserlys. Derfor skal nedenstående instruktioner nøje følges under service.

Følg iøvrigt instruktionerne i servicemanualen.

ADVARSEL!!

Under service må øjnene ikke komme nær objektiv-linsen på den optiske pick-up enhed. I tilfælde af at det er nødvendigt at kontrollere udsendelsen af laserlys, skal det ske i en afstand af mere end 25 cm fra den optiske pick-up.

1. Laser-didoe data
   - Materiale: GaAlAs
   - Bølgelængde: 780 nm
   - Udstråling: Kontinuerlig
   - Laseroutput: Max. 0,4 mW*

     * Målt i 1,6 mm afstand fra overfladen af objektivlinsen på den optiske pick-up enhed.

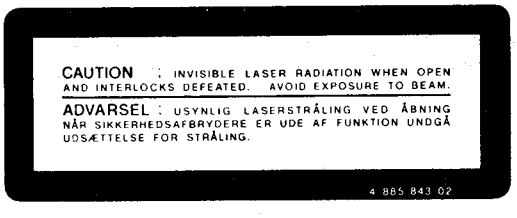
   - Klassifikation: Klasse IIIb.

2. Adskil aldrig den optiske pick-up enhed under service, og juster ikke APC kredsløbet (Automatic Power Control). Hvis APC kredsløbet (incl. laserdioden) bryder ned, skal hele den optiske pick-up enhed (incl. APC printkortet) udskiftes.

LASER ADVARSEL MÆRKNING

Følgende mærkning findes indvendig i apparatet:

1. Advarsel Mærkning

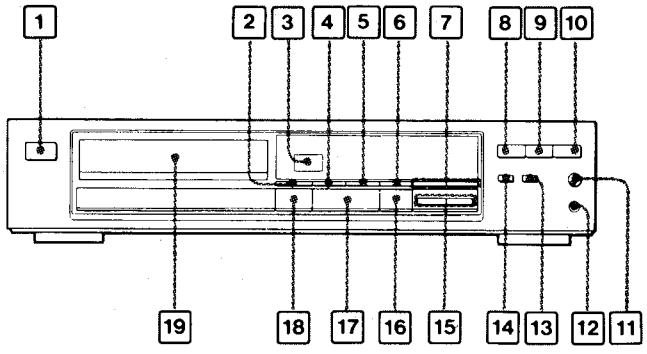

CAUTION : INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCKS DEFEATED. AVOID EXPOSURE TO BEAM.
ADVARSEL : USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION UNDGÅ UDSÆTTELSE FOR STRÅLING.
4 885 843 02

VAROITUS: Laite sisältää, laserdiodin, joka lähettää (näkymätöntä) silmille vaarallista lasersateilyä.

SECTION 1
GENERAL

1-1. LOCATION AND FUNCTION OF CONTROLS

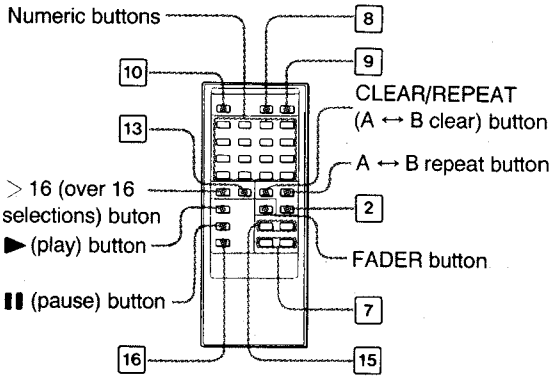
Front Panel



1. POWER switch
2. TIME button
3. Remote control sensor
4. AUTO SPACE button
5. REPEAT button
6. EDIT/TIME FADE button
7. ◀◀ ▶▶ (manual search) buttons
8. PROGRAM (or PGM) button
9. SHUFFLE button
10. CONTINUE button
11. PHONE LEVEL (headphones level) control
12. PHONES jack

*AMS is the abbreviation of Automatic Music Sensor.
**RMS is the abbreviation of Random Music Sensor.

Remote Commander



13. CLEAR (program clear) button
14. PGM CHECK (program check) button
15. ◀◀ ▶▶ (AMS*/RMS**) buttons
16. ■ (stop) button
17. ▶❚❚ (play/pause) button
18. ⏏ (OPEN/CLOSE) button
19. Disc compartment

Remote Control Operation

Once the POWER switch is turned on, you can remotely control various functions of the player with the remote commander.

Operations which performed only with the remote commander
- Direct music selection.
- A ‹ › B repeat.
- Fading in/Fading out the play.

Operations which cannot be performed with the remote commander
- Turning the power on and off.
- Opening and closing the disc compartment.
- Setting and releasing auto space function.
- Checking the programmed selections.
- Time edit function.
- Time fade function.

Notes on the remote commander and remote control operation
- Keep the commander away from extremely hot or humid places.
- Avoid dropping any foreign objects into the commander casing, particularly when replacing the batteries.
- To avoid a malfunction, do not simultaneously depress two or more buttons.
- Avoid exposure of the remote sensor to direct sunlight or lighting apparatus. Such exposure can cause a malfunction.

1-2. DESCRIPTION ON IC6 (MSC6458) SYSTEM CONTROL MICROCOMPUTER

IC6 has the following functions:

- Digital signal output to operation key
- Sub Q signal loading and processing
- Fluorescent display (FLD) control
- Servo circuit control

1 Pin Functions

Pin no.	Pin name	I/O	Description
1	PLL SW	O	"L" in play mode and "H" in search mode.
2	CLK	O	Command transfer of clock to SSP (IC3) and DSP (IC7).
3	DATA	O	Command transfer of data to SSP (IC3) and DSP (IC7).
4	XLK	O	Command transfer of latch to SSP (IC3) and DSP (IC7).
5	PRGL	O	Command transfer of latch to DFIL (IC9).
6	SYNC OUT	O	No connector (NC).
7	SENSE	I	SSP (IC2) and DSP (IC3) sense information.
8	SYNC ON	I	Sync REC ("L" in REC mode).
9	SIRCS	I	Remote control signal input.
10	SCOR	I	Q code read timing.
11	AF ADJ	I	No connection (NC).
12	ADJ	I	"L" in adjustment mode.
13	AMUTE	O	ALL muting. Output to DSP (IC3) MUTG.
14	EMPS	O	No connection (NC)
15	SUBQ	I	Subcode data.
16	SQCLK	O	Subcode data read clock.
17	GFS	I	"H" when CLV is locked.
18	FOK	I	"H" when focus is on.
19	KEY0	I	Key matrix input, "H" active.
20	KEY1	I	Key matrix input, "H" active.
21	KEY2	I	Key matrix input, "H" active.
22	KEY3	I	Key matrix input, "H" active.
23	KEY4	I	Key matrix input, "H" active.
24	KEY5	I	Key matrix input, "H" active.
25	INSW	I	Loading IN SW.
26	LDON	O	Laser on / off.
27	OUTSW	I/O	Loading OUT SW.
28	LODOUT	O	Loading motor control.
29	LODIN	O	Loading motor control.
30	OSC1	I	Oscillator input terminal (4 MHz).
31	OSC0	I	Oscillator input terminal (4 MHz).

Pin No.	Pin name	I/O	Descriprion
32	GND	—	GND terminal.
33	RESET	I	Reset input terminal. Input when power is turned on.
34	TEST	—	No connection (NC).
35	VL DOWN	—	No connection (NC).
36	VL UP	O	Volume up.
37	TIMER	O	No connection (NC).
38	LED	O	Volume indicator.
39	8G	O	FLD timing output.
40	7G	O	FLD timing output.
41	6G	O	FLD timing output.
42	5G	O	FLD timing output.
43	4G	O	FLD timing output.
44	3G	O	FLD timing output.
45	2G	O	FLD timing output.
46	1G	O	FLD timing output.
47	NC	—	No connection (NC).
48	o	O	FLD segment output.
49	n	O	FLD segment output.
50	m	O	FLD segment output.
51	+ 30V	—	+ 30V
52	l	O	FLD segment output.
53	k	O	FLD segment output.
54	j	O	FLD segment output.
55	i	O	FLD segment output.
56	h	O	FLD segment output.
57	g	O	FLD segment output.
58	f	O	FLD segment output.
59	e	O	FLD segment output.
60	d	O	FLD segment output.
61	c	O	FLD segment output.
62	b	O	FLD segment output.
63	a	O	FLD segment output.
64	VDD	—	positive(+) power supply (5V)

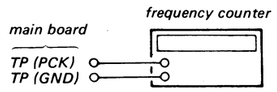
SECTION 2
ADJUSTMENTS

ELECTRICAL ADJUSTMENTS

1. Perform adjustments in the order given.
2. Use YEDS-18 (Part No. 3-702-101-01) disc unless otherwise indicated.
3. Use the oscilloscope with more than 10MΩ impedance.

RF PLL Frequency Adjustment/Lock Frequency Check

Procedure:

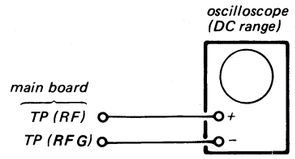


1. Ground test point TP (ASY).
2. Connect the frequency counter to the test points TP (PCK) and TP (GND).
3. Turn POWER switch on.
4. Adjust RV205 so that the reading on the frequeny counter is 4.3218MHz.
   ... (RF PLL frequency adjustment)
5. Remove the grounding wire from TP (ASY).
6. Put the disc (YEDS-18) in and press ▷ button.
7. Confirm that the reading on the frequency counter is locked at 4.3218 MHz.

Focus Bias Adjustment

This adjustment should be made after replacing the Optical Pick-up Block.

Procedure:

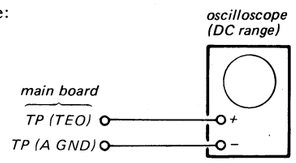


1. Connect oscilloscope to the test points TP (RF) and TP (RFG).
2. Turn POWER switch on.
3. Put the disc (YEDS-18) in and press ▷ button.
4. Adjust RV202 for an optimum waveform eye pattern. Optimum eye pattern means that shape "◇" can be clearly distinguished at the center of the waveform.

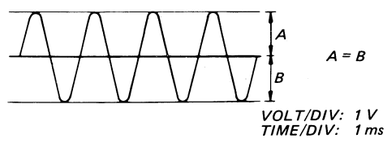
E-F Balance Adjustment

This adjustment should be made after replacing the Optical Pick-up Block.

Procedure:



1. Connect the oscilloscope to the test points TP (TEO) and TP (A GND).
2. Ground TP (ADJ) to set an adjustment mode.
3. Turn POWER switch on.
4. Put the disc (YEDS-18) in and press ▷ button.
5. Adjust RV201 so that the traverse waveform is symmetrical above and below.
6. After adjustment, cancel the adjustment mode.



Focus/Tracking Gain Adjustment

A frequency response analyzer is necessary in order to perform this adjustment exactly.

However, this gain has a margine, so even if it is slightly off, there is no problem. Therefore, this adjustment is not recomended generally to be performed.

Focus/tracking gains determine the pick-up follow-up (vertical and horizontal) relative to mechanical noise and mechanical shock when the 2-axis device operate.

However, as these reciprocate, the adjustment is at the point where both are satisfied.

- When gain is raised, the noise when the 2-axis device operates increases.
- When gain is lowered, it is more susceptible to mechanical shock and skipping occurs more easily.
- When gain adjustment is off, the symptoms below appear.

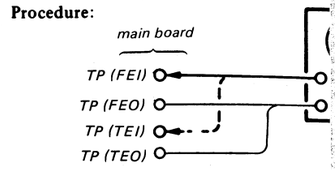
Symptoms \ Gain	Focus	Tracking
• The time until music starts becomes longer for STOP →▷PLAY or automatic selection (⏮ ⏭buttons pressed. (Normally takes about 2 seconds.)	low	low or high
• Music does not start and disc continues to rotate for STOP→▷PLAY or automatic selection (⏮ ⏭ buttons pressed.)	–	low
• Disc table opens shortly after STOP→▷PLAY.	low or high	–
• Sound is interrupted during PLAY. Or time counter display stops progressing.	–	low
• More poise during 2-axis device operation.	high	high

The following is a simple adjustment n

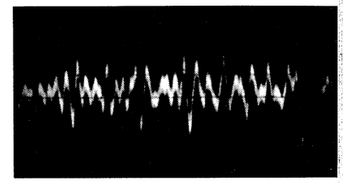
– Simple Adjustment –

Note: Since exact adjustment cannot be perfo
ber the positions of the controls before
adjustment. If the positions after the
ment are only a little different, return
the original position.

Procedure:

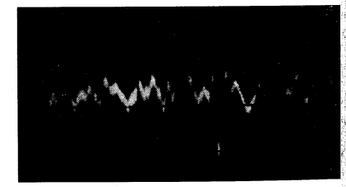


1. Keep the set flat.
   If the set is not horizontal, this cannot be performed due to the gra the 2 axis device.
2. Insert the disc (YEDS-18) and pres button.
3. Connect the oscilloscope to TP (F (FEO).
4. Adjustment RV203 so that the wa shown in the picture below. (focus ment)

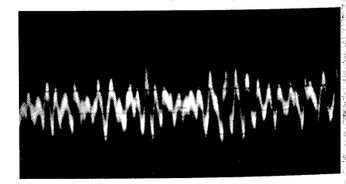


- Incorrent Examples (DC level is q from the adjusted waveform) (below)

low focus gain



high focus gain



Tracking Gain Adjustment

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time until music starts mes longer for STOP PLAY or automatic ction (⏮ ⏭buttons sed. (Normally takes ut 2 seconds.)	low	low or high
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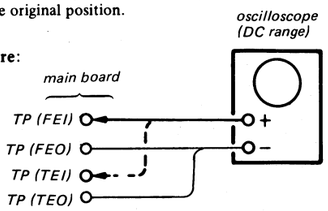
nd is interrupted dur-PLAY. Or time count-isplay stops progress-	–	low
e poise during 2-axis ce operation.	high	high

The following is a simple adjustment method.

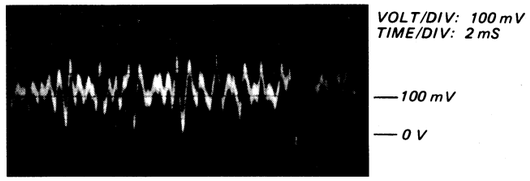
– Simple Adjustment –

Note: Since exact adjustment cannot be performed, remember the positions of the controls before performing the adjustment. If the positions after the simple adjustment are only a little different, return the controls to the original position.

Procedure:

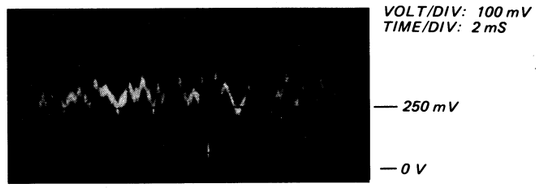


1. Keep the set flat.
   If the set is not horizontal, this adjustment cannot be performed due to the gravity against the 2 axis device.
2. Insert the disc (YEDS-18) and press ▷ PLAY button.
3. Connect the oscilloscope to TP (FEI) and TP (FEO).
4. Adjustment RV203 so that the waveform is as shown in the picture below. (focus gain adjustment)

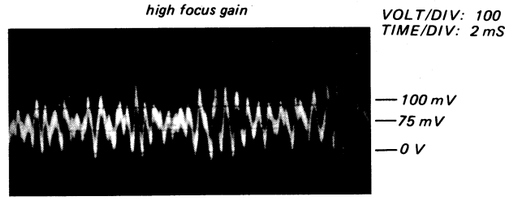


- Incorrent Examples (DC level is quite different from the adjusted waveform) (below)

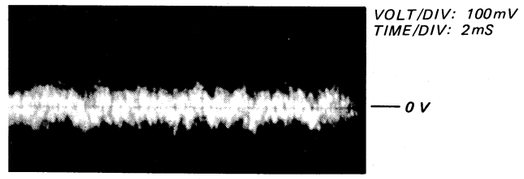
low focus gain



high focus gain

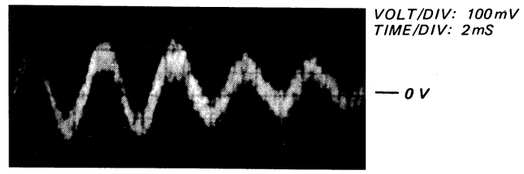


5. Connect the oscilloscope to TP (TEI), TP (TEO).
6. Adjust RV204 so that the waveform is as shown in the picture below. (tracking gain adjustment)

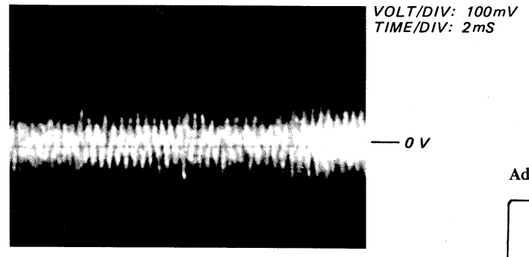


- Incorrect Examples (fundamental wave appears)

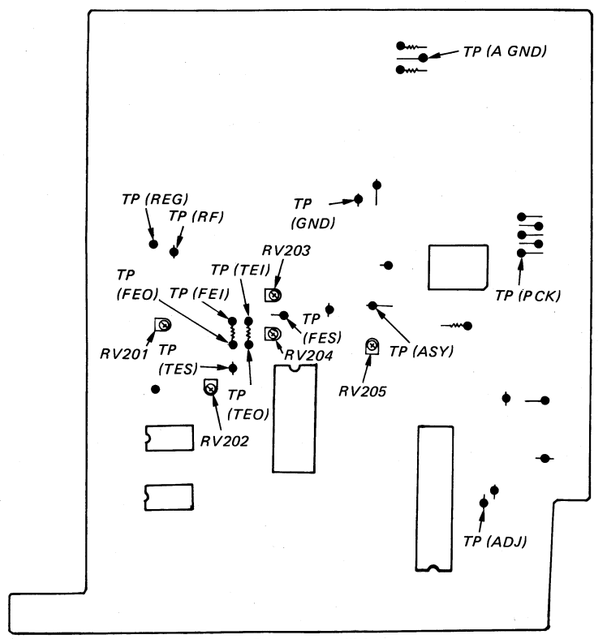
low tracking gain



high tracking gain
(higher frequency of the fundamental wave than above)



Adjustment Location: main board

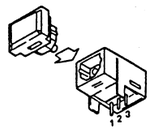


–Component Side–

SECTION 3
DIAGRAMS

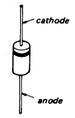
3-1. SEMICONDUCTOR LEAD LAYOUTS

GP1F31T

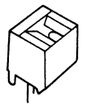


2SB1068-K

10E2



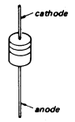
GP1U52



2SK381C

BA1A4M
BA1L4M

RD6.8ES-B1
1SS202-1

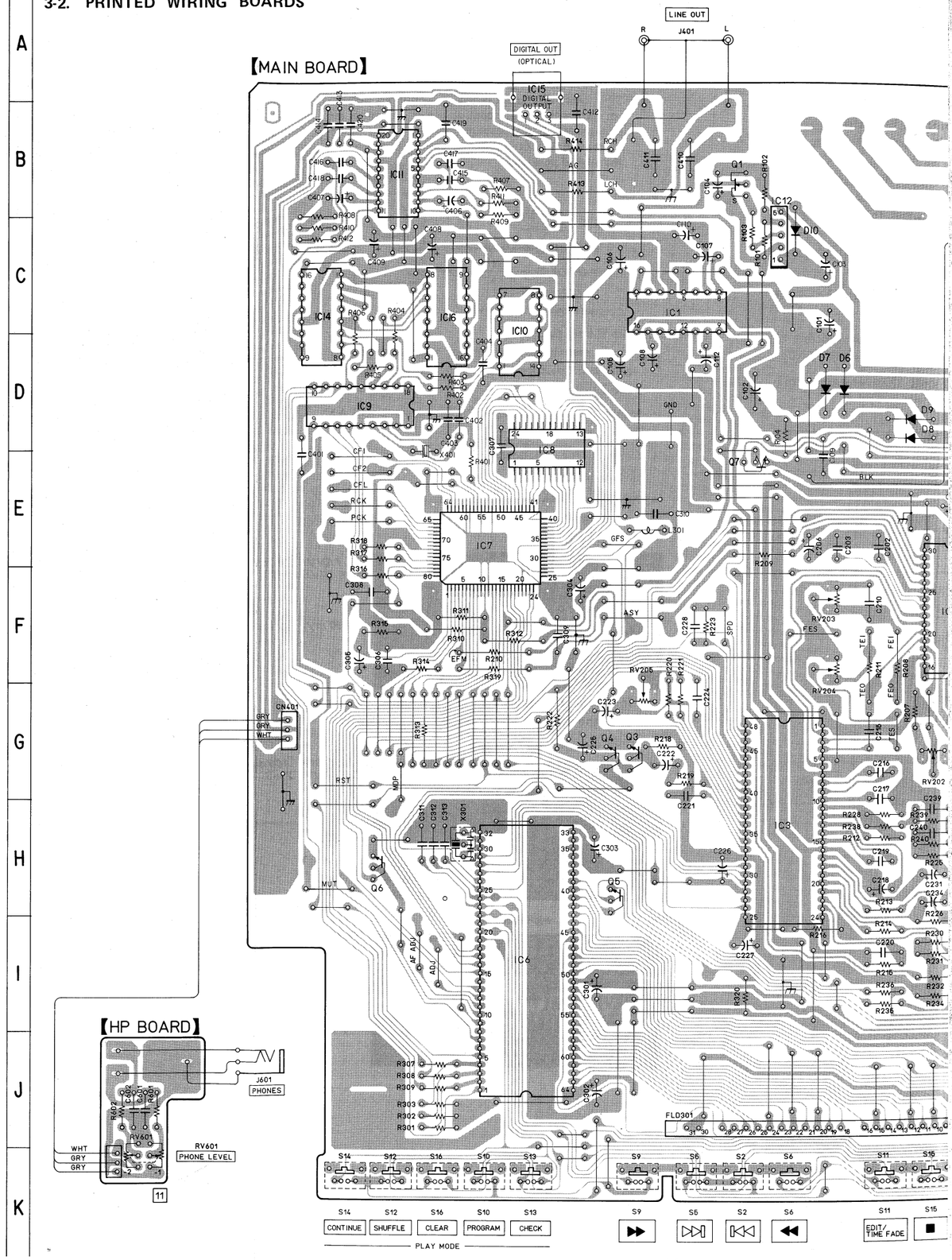


- **SEMICONDUCTOR LOCATION**

Ref. No.	Location	Ref. No.	Location
D1	E-10	IC8	D-5
D3	J-9	IC9	D-3
D4	J-9	IC10	C-5
D5	J-9	IC11	B-4
D6	D-7	IC12	C-7
D7	D-7	IC13	J-12
D8	D-8	IC14	C-3
D9	D-8	IC15	B-5
D10	C-7	IC16	C-4
IC1	C-6	Q1	B-7
IC2	F-8	Q2	G-9
IC3	H-7	Q3	G-6
IC4	H-9	Q4	G-5
IC5	I-9	Q5	H-5
IC6	I-5	Q6	H-3
IC7	E-4	Q7	E-7

- ○—— : parts extracted from the component side.
- ●—— : parts extracted from the conductor side.
- ○—●—○ : Jumper wire connected to the ground pattern on the component side.

3-2. PRINTED WIRING BOARDS



LINE OUT
J401
R
L
DIGITAL OUT (OPTICAL)
IC15 DIGITAL OUTPUT
CNP901
AC IN
TN-2
TN-1
(CHASSIS)
PT1 POWER TRANSFORMER
(OPTICAL PICKUP BLOCK KSS-150A)
【SL/SP MOTOR BOARD】
ORG/WHT
BLU/WHT
WHT
PNK/WHT
CN200A
M101 SLED MOTOR
IBI01
IBI02
S101 LIMIT SWITCH
M102 SPINDLE MOTOR
11
【SW BOARD】
WHT
GRY
S501 POWER
OFF
ON
【I/O SWITCH BOARD】
【LD MOTOR BOARD】
S701 IN/OUT SW
CN200
M103 LOADING MOTOR
【SENSOR BOARD】
IC13
CN301
FLD301
S10 PROGRAM
S13 CHECK
S9
S5
S2
S6
S11 EDIT/ TIME FADE
S15
S7 REPEAT
S3
S4 AUTO SPACE
S8 OPEN/ CLOSE
S1 TIME

3-3. SCHEMATIC DIAGRAM

【LD MOTOR BOARD】

【I/O SWITCH BOARD】

【SL/SP MOTOR BOARD】

(BU-5) OPTICAL PICK-UP BLOCK (KSS-150A)

【MAIN BOARD】

FLD301 FLUORESCENT INDICATOR TUBE

IC4 IC5 DRIVE AMP

IC3 FOCUS /TRACKING /SLED SERVO

IC6 SYSTEM CONTROL

IC7 DIGITAL SIGNAL P /CLV SERVO

Q5 +32V SWITCH

Q3, Q4 PLL SWITCH

Q6 SWITCH

IC13 REMOTE CONTROL DETECTOR

【SENSOR BOARD】

PICK-UP BLOCK (KSS-150A)

DETECTOR

CN PH RED

CN PH WHT

CN202 PH BLU

CN201 PH BLK

【SW BOARD】

S501 POWER OFF ON

CN DA

CN101 DR

PT1 POWER TRANSFORMER

CNP901

AC IN

TN-1

TN-2

※ NOT REPLACEABLE BUILT IN TRANSFORMER

Q2 LASER SWITCH

IC12 +30V REG

D1 HZS6.8NT2

Q1 REG SWITCH

D10 10E2-TA2

Q1 2SK381-TP

IC12 M5231TL

D6 10E2-TA2

D7 10E2-TA2

D8 10E2-TA2

D9 10E2-TA2

IC2 RF AMP/SIGNAL PROCESSOR /LASER ON CIRCUIT

IC1 +/- 5V REG.

IC1 M5294P

Q7 BA1A4M

RFG

RF0

E-F BALANCE

FOCUS BIAS

FOCUS GAIN

TRACKING GAIN

TES

TEI

FEO

FEI

ASY

FES

TEO

SPD

EFM

GFS

RST

RF PLL FREQUENCY

Q3, Q4 PLL SWITCH

IC3 CXA1082BR

RV204

IC2 CXA1081S

L301 OMH

DIGITAL OUT (OPTICAL)

C412 0.1μ

IC15 GP1F31T (DIGITAL OUTPUT)

IC10 SHAPER

IC14 IC16 D/A CONVERTER

IC11 AUDIO AMP

GND

+5V

IC8 16-BIT RAM

IC10 MC74HCU04N

IC16 PCM56P-S

IC14 PCM56P-S

IC11 M5204P

IC9 CXD2550P

IC9 DIGITAL FILTER

IC7 DIGITAL SIGNAL PROCESSOR /CLV SERVO

IC7 CXD1125QX

IC8 CXA1081S

AG

L-CH

R-CH

J401 LINE OUT

L-CH

R-CH

(DATA)

CF1

CF2

PCK

RCK

CFL

CN DS 【HP BOARD】

RV601 PHONE LEVEL

J601 PHONES

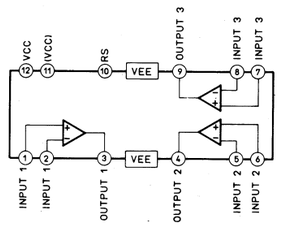
Note on Schematic Diagram:

- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistores are in Ω and ¼W or less unless otherwise specified.
- △ : internal component.
- ▬▬ : B +bus
- ▬ ▬ : B −bus
- ▭ : adjustment for repair
- Signal path.
  - ⇨ : CD
- Voltage and waveforms are dc with respect to ground under no-signal conditions.
  - no mark: STOP Mode
  - ( ): PLAY
- Voltages are taken with a VOM. (Input impedance 10MΩ) Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers referto waveforms.

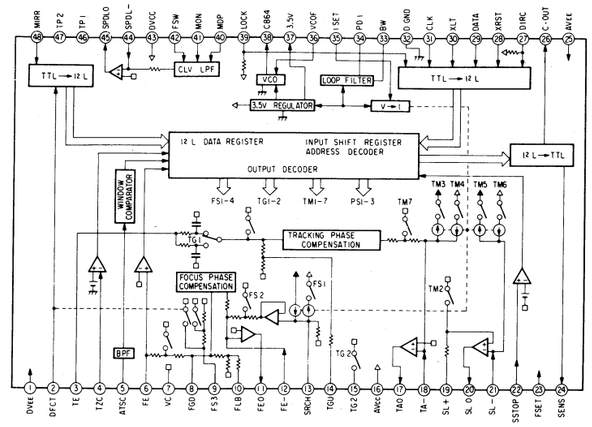
Note:	**Note:**
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

3-4. IC BLOCK DIAGRAMS

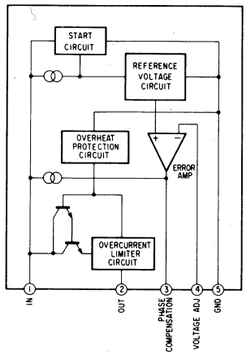
IC4, 5 CXA1291P



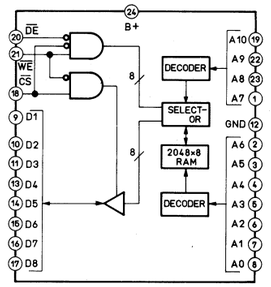
IC3 CXA1082BS



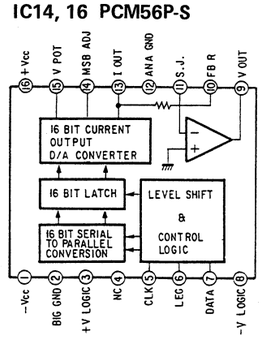
IC12 M5231TL



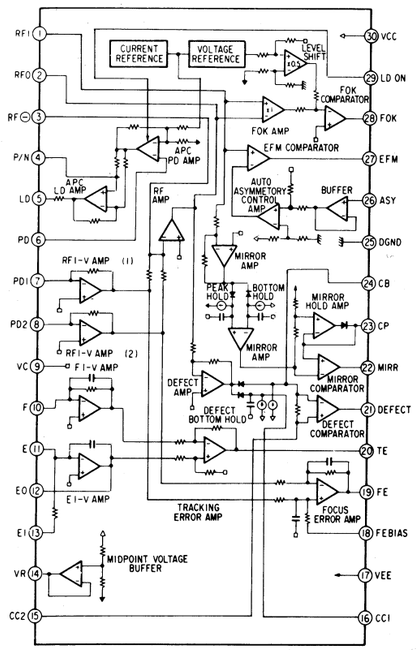
IC8 CXK5816M-12L



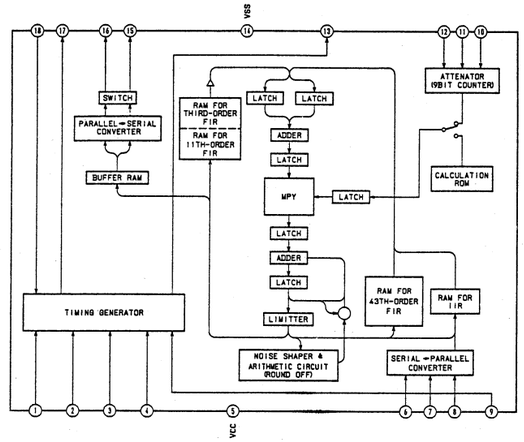
IC14, 16 PCM56P-S



IC2 CXA1081S



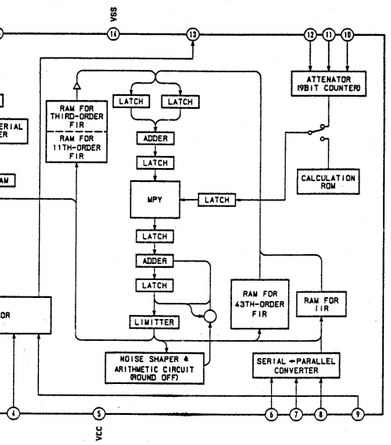
IC9 CXD2550P



3-5. WAVEFORMS

① OSCI 250n SEC —5.2V —-0.2V	⑤ MDS PLAY: 5V 0V 130μsec	⑨ FE PLAY: 0V APPROX. 100Vmvp-p
② MDP PLAY: 540 μSEC 5V —2.4V	⑥ WDCK 22μSEC 5Vp-p —0V	⑩ TE PLAY: APPROX. 500mVp-p
③ VCO I 120nSEC — 4.5V — 0.6V	⑦ C210 480nSEC —5V —0V	⑪ RF PLAY: 31.3 p-p
④ VCO O 120nSEC — 3.1V — 1.4V	⑧ BCK 240nSEC -5V —0V	⑫ XTAL 62nSEC 5.4 —0.4

0P



AVEFORMS

SCI 250n SEC —5.2V —0.2V	⑤ MDS PLAY: 5V 0V 130μsec	⑨ FE PLAY: 0V APPROX. 100VmVp-p
0P 640 μSEC 5V 2.4V	⑥ WDCK 22μSEC 5V p-p 0V	⑩ TE PLAY: 0V APPROX. 500mVp-p
C0 I 120nSEC 4.5V 0.6V	⑦ C210 480nSEC 5V 0V	⑪ RF PLAY: 31.3 p-p
C00 20nSEC 3.1V 1.4V	⑧ BCK 240nSEC 5V 0V	⑫ XTAL 62nSEC 5.4V 0.4V

SECTION 4 EXPLODED VIEWS

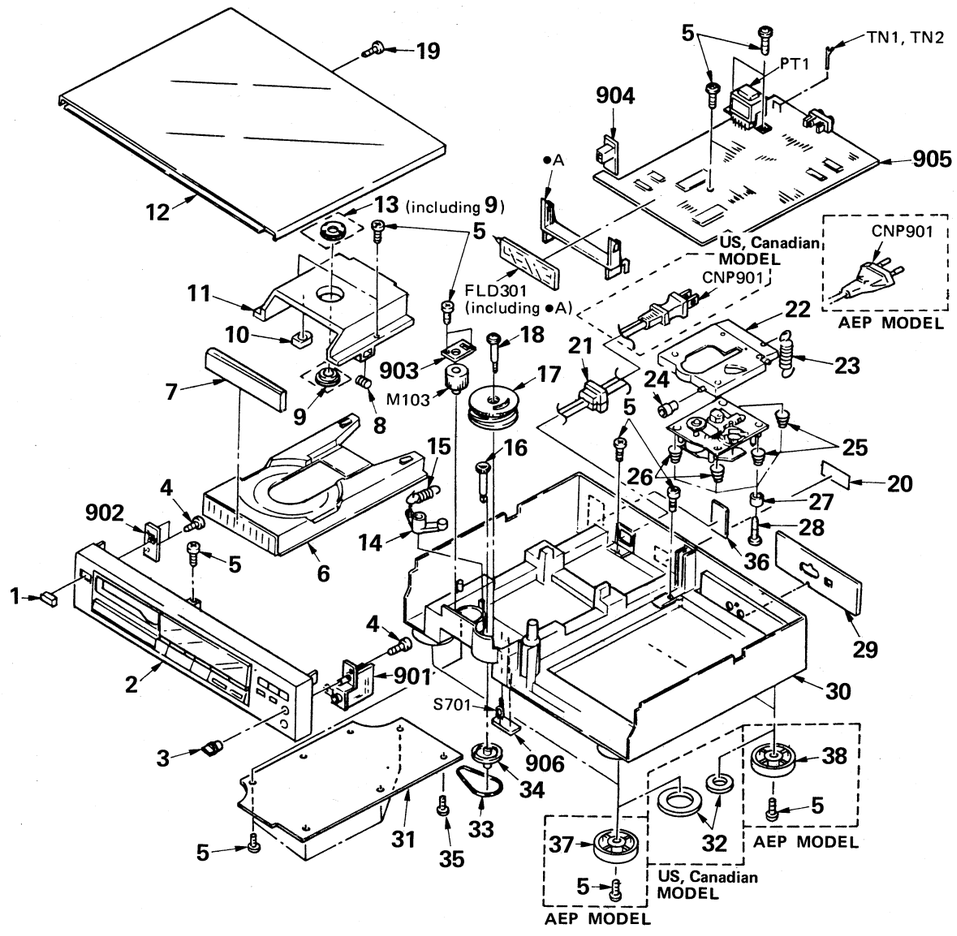
NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part number suffix -XX and -X may be different from the parts specified in the components used on the set.
- Color Indication of Appearance Parts
  Example:
  (RED) . . . KNOB, BALANCE (WHITE)
  ↑ ↑
  Cabinet's Color Parts' Color

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

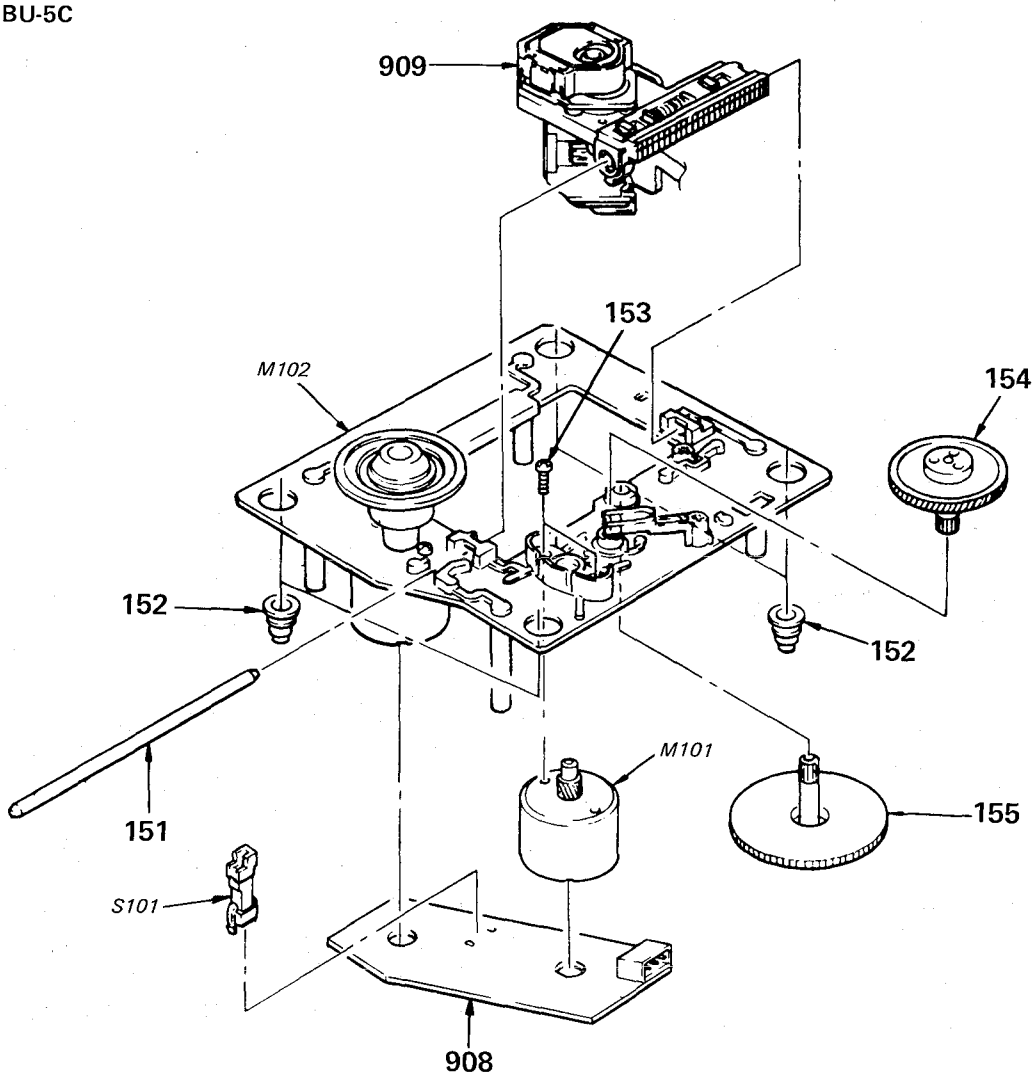
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifé.

4-1. CABINET SECTION



No.	Part No.	Description	Remarks
1	4-922-921-01	BUTTON (POWER)	
2	X-4922-572-1	(AEP).....PANEL ASSY, FRONT	
	X-4922-573-1	(US,Canadian)...PANEL ASSY, FRONT	
3	4-923-522-01	KNOB (B.TYPE), LOV (PHONE LEVEL)	
4	7-685-134-19	SCREW +BTP 2.6X8 TYPE2 N-S	
5	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S	
6	*4-925-307-01	TABLE, DISK	
7	4-929-062-01	PANEL, LOADING	
8	4-925-335-01	SPRING, COMPRESSION	
9	*4-918-679-04	PULLEY, PRESS	
10	*4-922-529-01	DAMPER	
11	*4-925-345-01	HOLDER (MG)	
12	4-925-348-01	CASE	
13	A-4665-024-A	MAGNET ASSY	
14	4-917-519-01	LEVER, SET	
15	4-917-514-01	SPRING, TENSION	
16	4-922-508-01	GEAR (DRIVING)	
17	4-925-306-01	GEAR (LOADING)	
18	7-685-152-19	SCREW, STEP	
19	7-685-650-79	SCREW (2), TAPPING	
20	*4-885-838-00	(AEP)....LABEL, CLASS 1	
21	*3-703-244-00	BUSHING (2104), CORD	
22	*4-922-514-01	BRACKET (BU-5)	
23	4-917-526-01	SPRING, TENSION	
24	4-917-515-01	ROLLER	
25	4-917-507-01	SPRING (H)	
26	4-917-541-01	SPRING (B)	
27	4-917-508-01	HOLDER, SP	
28	7-685-535-11	SCREW +BTP 2.6X10 TYPE2 N-S	
29	*4-927-302-21	(US).....PLATE, INDICATION	
	*4-927-302-31	(Canadian)...PLATE, INDICATION	
	*4-927-302-41	(AEP).....PLATE, INDICATION	
30	*4-925-346-01	CHASSIS	
31	*4-929-049-01	PLATE (H), BOTTOM	
32	4-922-942-01	(US,Canadian)...FOOT (FELT)	
33	4-917-522-02	BELT	
34	4-922-512-01	PULLEY	
35	7-685-879-01	SCREW +BVTT 3X30	
36	3-704-217-01	(US,Canadian)...LABEL	
37	X-4922-917-1	(AEP)...FOOT ASSY (F)	
38	X-4922-918-1	(AEP)...FOOT ASSY (R)	
901	*1-629-846-11	PC BOARD, H.P	
902	*1-629-847-11	PC BOARD, SW	
903	*1-629-848-11	PC BOARD, LD MOTOR	
904	*1-629-845-11	PC BOARD, SENSOR	
905	*A-4651-242-A	MOUNTED PCB, MAIN	
906	*1-629-849-11	PC BOARD, IO SWITCH	
⚠ CNP901	1-555-795-00	(AEP)....CORD, POWER, EULO PLUG	
⚠ CNP901	1-557-577-11	(US,Canadian)...CORD, POWER	
FLD301	1-519-479-21	INDICATOR TUBE, FLUORESCENT	
M103	A-4608-346-A	MOTOR ASSY, LOADING	
PT1 ⚠	1-449-024-11	(US,Canadian)...TRANSFORMER, POWER	
PT1 ⚠	1-449-025-11	(AEP).....TRANSFORMER, POWER	
TN1	*1-535-771-11	TERMINAL	
TN2	*1-535-771-11	TERMINAL	

4-2. BU-5C



Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

No.	Part No.	Description	Remarks
151	4-917-565-01	SHAFT, SLED	
152	4-917-562-01	INSULATOR	
153	7-621-255-15	SCREW +P 2X3	
154	4-917-567-01	GEAR (M)	
155	4-917-564-01	GEAR (P), FLATNESS	

No.	Part No.	Description	Remarks
908	*1-626-304-11	PC BOARD, SL/SP MOTOR	
909	⚠.8-848-062-01	DEVICE, OPTICAL KSS-150A (RP)	
M101	X-4917-504-1	ASSY, MOTOR (SLED)	
M102	X-4917-523-1	ASSY, MOTOR (SPINDLE)	
S101	1-571-274-11	SWITCH, LEAF	

SECTION 5
ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF: μF, PF: μμF.

RESISTORS
- All resistors are in ohms.
- F: nonflammable

COILS
- MMH: mH, UH: μH

SEMICONDUCTORS
In each case, U: μ, for example:
UA...: μA..., UPA...: μPA...,
UPC...: μPC, UPD...: μPD...

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref.No.	Part No.	Description			
901	*1-629-846-11	PC BOARD, H.P			
902	*1-629-847-11	PC BOARD, SW			
903	*1-629-848-11	PC BOARD, LD MOTOR			
904	*1-629-845-11	PC BOARD, SENSOR			
905	*A-4651-242-A	MOUNTED PCB, MAIN			
906	*1-629-849-11	PC BOARD, IO SWITCH			
908	*1-626-304-11	PC BOARD, SL/SP MOTOR			
909	⚠.8-848-062-01	DEVICE, OPTICAL KSS-150A (RP)			
C101	1-124-556-11	ELECT	2200MF	20%	16V
C102	1-124-898-11	ELECT	4700MF	20%	16V
C103	1-124-572-11	ELECT	100MF	20%	63V
C104	1-123-875-11	ELECT	10MF	20%	50V
C105	1-124-443-00	ELECT	100MF	20%	10V
C106	1-124-443-00	ELECT	100MF	20%	10V
C107	1-124-927-11	ELECT	4.7MF	20%	50V
C108	1-123-875-11	ELECT	10MF	20%	50V
C109	1-161-379-00	CERAMIC	0.01MF	20%	16V
C110	1-124-443-00	ELECT	100MF	20%	10V
C112	1-124-499-11	ELECT	1MF	20%	50V
C201	1-161-375-00	CERAMIC	0.0022MF	30%	16V
C202	1-136-153-00	FILM	0.01MF	5%	50V
C203	1-136-153-00	FILM	0.01MF	5%	50V
C204	1-162-205-31	CERAMIC	18PF	5%	50V
C205	1-162-205-31	CERAMIC	18PF	5%	50V
C206	1-124-902-00	ELECT	0.47MF	20%	50V
C208	1-124-443-00	ELECT	100MF	20%	10V
C209	1-124-443-00	ELECT	100MF	20%	10V
C210	1-161-377-00	CERAMIC	0.0047MF	20%	16V
C211	1-136-159-00	FILM	0.033MF	5%	50V
C212	1-124-477-11	ELECT	47MF	20%	16V
C213	1-164-159-11	CERAMIC	0.1MF		50V
C214	1-162-294-31	CERAMIC	0.001MF	10%	50V
C215	1-161-375-00	CERAMIC	0.0022MF	30%	16V
C216	1-136-165-00	FILM	0.1MF	5%	50V
C217	1-136-159-00	FILM	0.033MF	5%	50V
C218	1-123-382-00	ELECT	3.3MF	20%	50V
C219	1-136-165-00	FILM	0.1MF	5%	50V
C220	1-161-379-00	CERAMIC	0.01MF	20%	16V
C221	1-161-377-00	CERAMIC	0.0047MF	20%	16V
C222	1-124-927-11	ELECT	4.7MF	20%	50V
C223	1-124-477-11	ELECT	47MF	20%	16V
C224	1-162-294-31	CERAMIC	0.001MF	10%	50V
C225	1-124-499-11	ELECT	1MF	20%	50V
C226	1-124-499-11	ELECT	1MF	20%	50V

Ref.No.	Part No.	Description			
C227	1-124-443-00	ELECT	100MF	20%	10V
C228	1-162-282-31	CERAMIC	100PF	10%	50V
C231	1-124-443-00	ELECT	100MF	20%	10V
C232	1-164-159-11	CERAMIC	0.1MF		50V
C233	1-164-159-11	CERAMIC	0.1MF		50V
C234	1-123-875-11	ELECT	10MF	20%	50V
C235	1-124-477-11	ELECT	47MF	20%	16V
C236	1-124-477-11	ELECT	47MF	20%	16V
C238	1-136-165-00	FILM	0.1MF	5%	50V
C239	1-161-375-00	CERAMIC	0.0022MF	30%	16V
C240	1-162-291-31	CERAMIC	560PF	10%	50V
C301	1-123-875-11	ELECT	10MF	20%	50V
C302	1-124-443-00	ELECT	100MF	20%	10V
C303	1-124-499-11	ELECT	1MF	20%	50V
C304	1-124-499-11	ELECT	1MF	20%	50V
C305	1-124-902-00	ELECT	0.47MF	20%	50V
C306	1-136-159-00	FILM	0.033MF	5%	50V
C307	1-164-159-11	CERAMIC	0.1MF		50V
C308	1-164-159-11	CERAMIC	0.1MF		50V
C309	1-161-379-00	CERAMIC	0.01MF	20%	16V
C310	1-164-159-11	CERAMIC	0.1MF		50V
C311	1-162-291-31	CERAMIC	560PF	10%	50V
C312	1-162-291-31	CERAMIC	560PF	10%	50V
C313	1-162-291-31	CERAMIC	560PF	10%	50V
C401	1-164-159-11	CERAMIC	0.1MF		50V
C402	1-162-204-31	CERAMIC	16PF	5%	50V
C403	1-162-203-31	CERAMIC	15PF	5%	50V
C404	1-164-159-11	CERAMIC	0.1MF		50V
C406	1-124-927-11	ELECT	4.7MF	20%	50V
C407	1-124-927-11	ELECT	4.7MF	20%	50V
C408	1-124-443-00	ELECT	100MF	20%	10V
C409	1-124-443-00	ELECT	100MF	20%	10V
C410	1-162-291-31	CERAMIC	560PF	10%	50V
C411	1-162-291-31	CERAMIC	560PF	10%	50V
C412	1-164-159-11	CERAMIC	0.1MF		50V
C413	1-162-286-31	CERAMIC	220PF	10%	50V
C414	1-162-286-31	CERAMIC	220PF	10%	50V
C415	1-130-481-00	MYLAR	0.0068MF	5%	50V
C416	1-130-481-00	MYLAR	0.0068MF	5%	50V
C417	1-130-471-00	MYLAR	0.001MF	5%	50V
C418	1-130-471-00	MYLAR	0.001MF	5%	50V
C419	1-164-159-11	CERAMIC	0.1MF		50V
C420	1-164-159-11	CERAMIC	0.1MF		50V
C421	1-164-159-11	CERAMIC	0.1MF		50V
C601	1-161-374-11	CERAMIC	0.0015MF	30%	16V
C602	1-161-374-11	CERAMIC	0.0015MF	30%	16V

Ref.No.	Part No.	Description
CN101	*1-564-339-21	PIN, CONNECTOR 5P
CN200	*1-564-495-11	PIN, CONNECTOR 2P
CN200A	*1-564-720-11	PIN, CONNECTOR (SMALL TYPE) 4P
CN202	*1-564-710-11	PIN, CONNECTOR (SMALL TYPE) 8P
CN203	*1-564-706-11	PIN, CONNECTOR (SMALL TYPE) 4P
CN204	*1-564-339-00	PIN, CONNECTOR 5P
CN301	*1-566-165-11	CONNECTOR, BOARD TO BOARD 3P
CN401	*1-564-337-00	PIN, CONNECTOR 3P
⚠CNP901	.1-555-795-00	(AEP)....CORD, POWER, EULO PLUG
⚠CNP901	.1-557-577-11	(US,Canadian)...CORD, POWER
D1	8-719-109-96	DIODE RD6.8ES-B1
D3	8-719-107-94	DIODE 1SS202-1
D4	8-719-107-94	DIODE 1SS202-1
D5	8-719-107-94	DIODE 1SS202-1
D6	8-719-200-02	DIODE 10E2
D7	8-719-200-02	DIODE 10E2
D8	8-719-200-02	DIODE 10E2
D9	8-719-200-02	DIODE 10E2
D10	8-719-200-02	DIODE 10E2
FLD301	1-519-479-21	INDICATOR TUBE, FLUORESCENT
IC1	8-759-631-40	IC M5294P
IC2	8-752-034-00	IC CXA1081S
IC3	8-752-032-30	IC CXA1082BS
IC4	8-752-035-28	IC CXA-1291P
IC5	8-752-035-28	IC CXA-1291P
IC6	8-759-978-34	IC MSC6458-32SS
IC7	8-752-328-62	IC CXD1125Q
IC8	8-752-323-64	IC CXK5816M-12L
IC9	8-752-328-72	IC CXD2550P
IC10	8-759-202-13	IC TC74HCU04P
IC11	8-759-631-39	IC M5204P
IC12	8-759-605-43	IC M5231TL
IC13	8-749-920-03	IC GP1U52 (DIGITAL OUT)
IC14	8-759-937-95	IC PCM56P-S
IC15	8-759-977-71	IC GP1F31T
IC16	8-759-937-95	IC PCM56P-S
IB101	1-233-171-11	COMPOSITION CIRCUIT BLOCK
IB102	1-233-171-11	COMPOSITION CIRCUIT BLOCK
J401	*1-562-999-21	JACK, PIN 2P (LINE OUT)
J601	*1-568-151-11	JACK, LARGE TYPE (PHONES)
L301	*1-410-858-11	INDUCTOR 0UH
M101	X-4917-504-1	ASSY, MOTOR (SLED)
M102	X-4917-523-1	ASSY, MOTOR (SPINDLE)
M103	A-4608-346-A	MOTOR ASSY, LOADING

Ref.No.	Part No.	Description			
PT1	⚠.1-449-024-11	(US,Canadian)...TRANSFORMER, POWER			
PT1	⚠.1-449-025-11	(AEP).....TRANSFORMER, POWER			
Q1	8-729-600-94	TRANSISTOR 2SK381C			
Q2	8-729-116-57	TRANSISTOR 2SB1068-K			
Q3	8-729-115-79	TRANSISTOR BA1A4M			
Q4	8-729-115-77	TRANSISTOR BA1L4M			
Q5	8-729-115-77	TRANSISTOR BA1L4M			
Q6	8-729-115-77	TRANSISTOR BA1L4M			
Q7	8-729-115-79	TRANSISTOR BA1A4M			
R101	1-249-439-11	CARBON	68K	5%	1/4W
R102	1-249-423-11	CARBON	3.3K	5%	1/4W
R103	1-249-417-11	CARBON	1K	5%	1/4W
R104	1-249-429-11	CARBON	10K	5%	1/4W
R201	1-247-864-11	CARBON	24K	5%	1/4W
R202	1-249-433-11	CARBON	22K	5%	1/4W
R203	1-249-417-11	CARBON	1K	5%	1/4W
R204	1-249-397-11	CARBON	22	5%	1/4W
R205	1-247-806-11	CARBON	91	5%	1/4W
R206	1-249-432-11	CARBON	18K	5%	1/4W
R207	1-249-432-11	CARBON	18K	5%	1/4W
R208	1-249-425-11	CARBON	4.7K	5%	1/4W
R209	1-249-441-11	CARBON	100K	5%	1/4W
R210	1-249-417-11	CARBON	1K	5%	1/4W
R211	1-249-425-11	CARBON	4.7K	5%	1/4W
R212	1-247-882-11	CARBON	130K	5%	1/4W
R213	1-249-440-11	CARBON	82K	5%	1/4W
R214	1-249-423-11	CARBON	3.3K	5%	1/4W
R215	1-247-896-11	CARBON	510K	5%	1/4W
R216	1-249-429-11	CARBON	10K	5%	1/4W
R218	1-249-433-11	CARBON	22K	5%	1/4W
R219	1-249-414-11	CARBON	560	5%	1/4W
R220	1-249-441-11	CARBON	100K	5%	1/4W
R221	1-215-434-00	METAL	3.6K	1%	1/6W
R222	1-249-429-11	CARBON	10K	5%	1/4W
R223	1-249-441-11	CARBON	100K	5%	1/4W
R224	1-249-393-11	CARBON	10	5%	1/4W
R225	1-249-435-11	CARBON	33K	5%	1/4W
R226	1-247-889-00	CARBON	270K	5%	1/4W
R227	1-249-393-11	CARBON	10	5%	1/4W
R228	1-249-423-11	CARBON	3.3K	5%	1/4W
R229	1-247-881-00	CARBON	120K	5%	1/4W
R230	1-249-427-11	CARBON	6.8K	5%	1/4W
R231	1-249-425-11	CARBON	4.7K	5%	1/4W
R232	1-249-437-11	CARBON	47K	5%	1/4W
R233	1-249-435-11	CARBON	33K	5%	1/4W

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note:
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref.No.	Part No.	Description			
R234	1-247-882-11	CARBON	130K	5%	1/4W
R235	1-247-883-00	CARBON	150K	5%	1/4W
R236	1-247-883-00	CARBON	150K	5%	1/4W
R237	1-247-882-11	CARBON	130K	5%	1/4W
R238	1-249-432-11	CARBON	18K	5%	1/4W
R239	1-249-432-11	CARBON	18K	5%	1/4W
R240	1-249-423-11	CARBON	3.3K	5%	1/4W
R301	1-249-425-11	CARBON	4.7K	5%	1/4W
R302	1-249-425-11	CARBON	4.7K	5%	1/4W
R303	1-249-425-11	CARBON	4.7K	5%	1/4W
R304	1-249-435-11	CARBON	33K	5%	1/4W
R305	1-249-435-11	CARBON	33K	5%	1/4W
R306	1-249-435-11	CARBON	33K	5%	1/4W
R307	1-249-417-11	CARBON	1K	5%	1/4W
R308	1-249-417-11	CARBON	1K	5%	1/4W
R309	1-249-417-11	CARBON	1K	5%	1/4W
R310	1-215-469-00	METAL	100K	1%	1/6W
R311	1-215-469-00	METAL	100K	1%	1/6W
R312	1-249-429-11	CARBON	10K	5%	1/4W
R313	1-249-441-11	CARBON	100K	5%	1/4W
R314	1-249-433-11	CARBON	22K	5%	1/4W
R315	1-247-903-00	CARBON	1M	5%	1/4W
R316	1-249-417-11	CARBON	1K	5%	1/4W
R317	1-249-417-11	CARBON	1K	5%	1/4W
R318	1-249-417-11	CARBON	1K	5%	1/4W
R319	1-249-429-11	CARBON	10K	5%	1/4W
R320	1-249-429-11	CARBON	10K	5%	1/4W
R401	1-249-411-11	CARBON	330	5%	1/4W
R402	1-249-411-11	CARBON	330	5%	1/4W
R403	1-249-411-11	CARBON	330	5%	1/4W
R404	1-249-411-11	CARBON	330	5%	1/4W
R405	1-249-411-11	CARBON	330	5%	1/4W
R406	1-249-411-11	CARBON	330	5%	1/4W
R407	1-249-439-11	CARBON	68K	5%	1/4W
R408	1-249-439-11	CARBON	68K	5%	1/4W
R409	1-249-417-11	CARBON	1K	5%	1/4W
R410	1-249-417-11	CARBON	1K	5%	1/4W
R411	1-249-417-11	CARBON	1K	5%	1/4W
R412	1-249-417-11	CARBON	1K	5%	1/4W
R413	1-249-417-11	CARBON	1K	5%	1/4W
R414	1-249-417-11	CARBON	1K	5%	1/4W
R601	1-249-402-11	CARBON	56	5%	1/4W
R602	1-249-402-11	CARBON	56	5%	1/4W
RV201	1-228-995-00	RES, ADJ, CARBON 22K			
RV202	1-228-993-00	RES, ADJ, CARBON 4.7K			
RV203	1-228-995-00	RES, ADJ, CARBON 22K			

Ref.No.	Part No.	Description
RV204	1-228-995-00	RES, ADJ, CARBON 22K
RV205	1-228-990-00	RES, ADJ, METAL GLAZE 1K
RV601	1-238-302-11	RES, VAR, CARBON 1K/1K (PHONE LEVEL)
S1	1-571-685-11	SWITCH, KEY BOARD (TIME)
S2	1-571-686-11	SWITCH, KEY BOARD (⏮)
S3	1-571-686-11	SWITCH, KEY BOARD (⏯)
S4	1-571-685-11	SWITCH, KEY BOARD (AUTO SPACE)
S5	1-571-686-11	SWITCH, KEY BOARD (⏭)
S6	1-571-685-11	SWITCH, KEY BOARD (◀◀)
S7	1-571-685-11	SWITCH, KEY BOARD (REPEAT)
S8	1-571-686-11	SWITCH, KEY BOARD (OPNE/CLOSE)
S9	1-571-685-11	SWITCH, KEY BOARD (▶▶)
S10	1-571-685-11	SWITCH, KEY BOARD (PROGRAM)
S11	1-571-685-11	SWITCH, KEY BOARD (EDIT/TIME FADE)
S12	1-571-685-11	SWITCH, KEY BOARD (SHUFFLE)
S13	1-571-685-11	SWITCH, KEY BOARD (CHECK)
S14	1-571-685-11	SWITCH, KEY BOARD (CONTINUE)
S15	1-571-686-11	SWITCH, KEY BOARD (■)
S16	1-571-685-11	SWITCH, KEY BOARD (CLEAR)
S101	1-571-274-11	SWITCH, LEAF
S501	1-571-305-11	SWITCH, PUSH (1 KEY)(POWER)
S701	1-571-300-11	SWITCH, ROTARY (IN/OUT)
TN1	*1-535-771-11	TERMINAL
TN2	*1-535-771-11	TERMINAL
X301	1-577-082-11	VIBRATOR, CERAMIC (4MHz)
X401	1-567-926-11	VIBRATOR, CRYSTAL (16.9MHz)

ACCESSORY & PACKING MATERIAL

1-465-050-11	REMOTE COMMANDER (RM-D170)
1-558-543-11	CORD, CONNECTION (○)
1-559-533-11	CORD, CONNECTION (○)
3-750-022-11	(AEP).....MANUAL, INSTRUCTION
3-750-022-21	(US,Canadian)...MANUAL, INSTRUCTION
3-750-022-31	(Canadian).....MANUAL, INSTRUCTION
3-750-022-41	(AEP).....MANUAL, INSTRUCTION
*3-795-629-11	(AEP).....INSTRUCTION
*3-704-339-01	SHEET (STANDARD), PROTECTION
*4-885-838-00	LABEL, CLASS 1
*4-929-061-01	INDIVIDUAL CARTON